

CLAIMS

1 A graft copolymer having a number average molecular
5 weight of at least 10 000 comprising:

- (a) backbone units derived from an ethylenically
unsaturated monomer,
- (b) hydrophilic uncharged side chains, and
- (c) cationically chargeable or charged side chains
10 containing a tertiary or quaternary nitrogen atom.

2 A graft copolymer as claimed in claim 1, wherein the
backbone units (a) are units derived from an ethylenically
15 unsaturated carboxylate.

3 A graft copolymer as claimed in claim 2, wherein the
backbone units (a) are methacrylate units.

4 A graft copolymer as claimed in claim 1, wherein the
units (b) have a chain length of at least 6 carbon atoms,
preferably at least 10 carbon atoms.

5 A graft copolymer as claimed in claim 1, wherein the
hydrophilic uncharged side chains (b) are polyethylene oxide
chains.

6 A graft copolymer as claimed in claim 5, wherein the
polyethylene oxide chains comprise at least 3, preferably at
least 6, ethylene oxide units.

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7 A graft copolymer as claimed in claim 5, wherein the
polyethylene oxide chains comprise at least 10, preferably
at least 30, polyethylene oxide units.

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8 A graft copolymer as claimed in claim 1, wherein the
units (c) are units of an ethylenically unsaturated monomer
containing an aliphatic or aromatic moiety which contains a
tertiary or quaternary nitrogen atom.

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9 A graft copolymer as claimed in claim 1, wherein the
units (c) are units of a tertiary amine acrylate or
methacrylate which may optionally be wholly or partially
quaternised.

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10 A graft copolymer as claimed in claim 9, wherein the
units (c) are units of 2-dimethylaminoethyl methacrylate
(DMAEMA) which may optionally be wholly or partially
quaternised.

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11 A graft copolymer as claimed in claim 1, which
comprises:
(a) backbone units of methacrylate,

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(b) polyethylene oxide side chains, and
(c) side chains of dimethylaminoethylmethacrylate (DMAEMA)
which may optionally be wholly or partially quaternised.

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12 A graft copolymer as claimed in claim 11, which
comprises from 70 to 99 mole%, in total, of the units (a)
and (b), and from 1 to 30 mole% of the units (c).

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13 A graft copolymer as claimed in claim 1, having a
number average molecular weight of at least 10 000,
preferably from 50 000 to 1 000 000, more preferably from
100 000 to 500 000, and a weight average molecular weight of
15 at least 20 000, preferably from 100 000 to 2 000 000, more
preferably from 200 000 to 1 000 000.

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14 A process for the preparation of a graft polymer as
claimed in claim 1, which comprises reacting

(i) a copolymer having backbone units derived from an
ethylenically unsaturated monomer and hydrophilic uncharged
side chains with

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(ii) a monomer containing cationically chargeable or charged
side chains containing a tertiary or quaternary nitrogen
atom,

in the presence of a free radical initiator.

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15 A process as claimed in claim 14, which comprises
reacting polyethylene glycol methyl ether methacrylate

(PEGMA) with a tertiary amine acrylate or methacrylate which may optionally be wholly or partially quaternised.

- 5 16 A process as claimed in claim 14, which comprises reacting PEGMA with 2-dimethylaminoethyl methacrylate (DMAEMA), optionally in wholly or partly quaternised form.
- 10 17 A laundry detergent composition comprising an organic detergent surfactant, and a graft copolymer as claimed in claim 1 in an amount effective to improve soil release.
- 15 18 A detergent composition as claimed in claim 17, which contains from 0.1 to 10 wt%, preferably from 0.25 to 5 wt%, of the graft copolymer.
- 20 19 A detergent composition as claimed in claim 17, which comprises:
- (a) from 5 to 60 wt%, preferably from 10 to 40 wt%, of organic detergent surfactant,
 - (b) optionally from 5 to 80 wt%, preferably from 10 to 25 60 wt%, of detergency builder,
 - (c) from 0.1 to 10 wt%, preferably from 0.25 to 5 wt%, of the graft copolymer, and
 - (d) optionally other detergent ingredients to 100 wt%.

20 A method of promoting soil release during laundering of
a textile fabric, which method comprises contacting the
fabric with a graft copolymer as claimed in claim 1, and
subsequently washing the fabric after wear or use of the
5 fabric.

21 Use of a graft copolymer as claimed in claim 1, in a
laundry detergent composition to promote the release of soil
10 from textile fabrics during laundering.

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